The Health Benefits of RED WINE

OPC, nature's most powerful anti-oxidant, is wonderfully abundant in the skins and seeds of grapes.

Could this be the secret of the "French Paradox"?

Part 1

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When you and your loved ones are gathered around the Christmas tree, when you're roasting chestnuts on an open fire and you sip from the red wine you have just gently whirled in your glass, you are surrounded by the good things in life. Amongst them you find even the very best thing in life. It is called "OPC".

OPC, an abbreviation for the tongue-twisting "oligomeric proanthocyanidins", is nature's ultimate protector. It helps red wine mature and age. It protects plants against the harsh influences of sunshine. Bark and leaves are full of it. It protects the oils in seeds and nuts against rancidity. It has the astringent taste that so many people connect with a healthy heart. And what's more, when no longer needed in the living plant, OPC turns out to be the precursor of the inspiring red pigment of red wine and autumn leaves.

Because OPC itself is colourless, it has always been a hidden and unobtrusive yet extremely influential factor behind many magnificent natural and biological phenomena. It had been overlooked by scientists of great stature, like, for instance, Nobel Prize-winner Albert Szent-Györgyi. This Hungarian scientist received the prize in 1937 for having discovered vitamin C. He also found that vitamin C worked better in the presence of a natural co-factor.

Because Szent-Györgyi had isolated his first vitamin C from citrus fruits, he attributed the vitamin C boosting phenomenon to the pigments that are so very visible in citrus fruits: the yellow bioflavonoids. However, Szent-Györgyi failed to get consistent results with his bioflavonoids.

JACK MASQUELIER

Later, during the late '40s at the University of Bordeaux, Szent-Györgyi met a young and enthusiastic colleague who had graduated with a thesis about the red pigment, "anthocyanin". This red pigment is very similar to bioflavonoids in structure, but very different in character. "But Mr Masquelier," Szent-Györgyi asked, "are you still interested in that? Don't you know that in the US no one believes in bioflavonoids any more?"

Discussing the issues, neither scientist realised that the vitamin C booster that Szent-Györgyi had failed to find had already been discovered by Jack Masquelier. In 1947, while researching the red pigment, Masquelier also found its precursor, the OPC. Now, half a century later, it turns out that OPC is the truly active vitamin C booster, and the cause of many a paradox—especially the "French Paradox".

THE FRENCH PARADOX

On 12th May 1979, the renowned English medical journal, *The Lancet*, published a now famous article written by A. S. St Leger, et al., "Factors associated with cardiac mortality in developed countries with particular reference to the consumption of wine". Not knowing that he had been describing the beneficial effects of OPC, St Leger summarises his principal finding as "...a strong and specific negative association between ischaemic heart-disease deaths and alcohol consumption. This is shown to be wholly attributable to wine consumption."

He also found that the health statistics of the 18 countries he included in his study showed that health is "not strongly associated with health-service factors such as doctor and nurse density". In other words, wine does more for your cardiovascular health than your doctor.

Those who didn't make a connection between cardiovascular health and wine as an abundant dietary source of OPC were baffled by the apparent but paradoxical compatibility of a low incidence of coronary atherosclerosis and cardiovascular mortality with

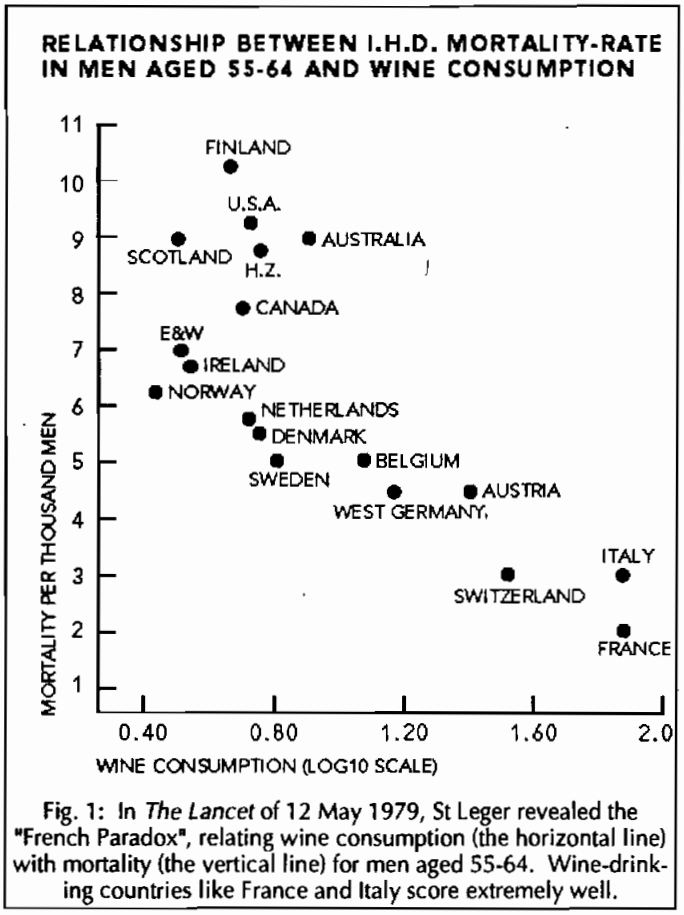


Fig. 1: In *The Lancet* of 12 May 1979, St Leger revealed the "French Paradox", relating wine consumption (the horizontal line) with mortality (the vertical line) for men aged 55-64. Wine-drinking countries like France and Italy score extremely well.

France's high-fat diet and relatively high number of avid cigarette-smokers. Also, many people simply equate wine with alcohol, and that makes the cardiovascular benefits of wine a contradiction in itself. That is how St Leger's findings were soon baptised with the name, "French Paradox".

WINE DRINKERS LIVE LONGER

The correlation between wine consumption and good health had already been demonstrated in France as early as 1933, when F. Dougnac compared the number of old people in his own region (the Médoc wine district) with the total number of old people in the whole of France. (See Fig. 2.) With advancing years, counting from the age of 60 onward, the percentages increase as follows:

Fig. 2:

AGE	ALL OF FRANCE	MEDOC REGION
60-64	4.661	6.259
65-69	3.644	5.000
70-79	4.559	6.500
ABOVE 80	1.053	1.981

- in the 60-64 age category, 34% more people lived in the Médoc region than in all of France;
- in the category 65-69 it was 37% more;
- for people in their 70s it was 42%;
- for people above 80 it was as much as 88%!

Due to their consumption of alcohol, the French are sometimes considered to have a high prevalence of alcoholism. But as far as wine is concerned, Dougnac's figures strongly contradict this alleged negative relationship. Moreover, the officially published figures in France concerning the mortality rate due to alcoholism repeatedly confirm his statistics year after year. Mortality due to alcoholism is lowest in the wine regions.

THE PARADOXES OF SCIENCE

To Jack Masquelier, now Professor Emeritus, the findings of St Leger hadn't come as a surprise but rather as a confirmation of Dougnac's study and of all the research he had been doing since 1945. In Masquelier's opinion, the mystery surrounding the French Paradox was already lifted in 1944 when his colleague, J. Lavollay, showed that administering 2 cc of red wine to laboratory animals doubled their vascular resistance.

Since Szent-Györgyi, "vascular resistance" or "vascular permeability" had been the key issue in all the research. Vascular permeability is monitored by vitamin C and its co-factor, which Szent-Györgyi believed to be the bioflavonoids. He had even coined a mixture of both, "vitamin P"—"P" after permeability. But vitamin P was never officially acknowledged as a true vitamin because the results reached with the bioflavonoids were inconsistent.

The Frenchman Lavollay demonstrated that red wine had a vitamin P effect. He experimented with red wine on animals and found that their capillary resistance increased. A lack of sufficient possibilities and knowledge about isolating these vitamin P factors led Lavollay to the conclusion that he was dealing with the effects of a molecule called "epicatechin". Epicatechin is the mirror-structure of "catechin", which is the building block of OPC. Lavollay didn't know that he was not dealing with epicatechin, but with polymerised forms (pairs and triplets) of epicatechin—with OPC. The Greek word *oligo* means "a few". OPC simply means "a few"—two or three catechin molecules together.

Because the catechin pairs and triplets stand alone in their capacity to transform into the red anthocyanin, we don't call them "oligomeric catechins" but "oligomeric proanthocyanidins", precursors of the red pigment.

RED WINE CONTAINS MORE OPC THAN WHITE WINE

Contrary to what many people believe, the colour of wine has nothing to do with the colour of the grapes. As Masquelier explains, it is not a matter of grape colour but a matter of production.

"Strangely enough," he tells us, "people don't really know the difference, in terms of production, between white wine and red wine. When I tell them that most varieties of champagne, which is a white wine, are obtained from red grapes, they think I'm joking. But no, the difference between white wine and red wine is a difference in production. White wine is made with only the juice of red grapes; nothing else. The juice is squeezed out of the grapes, just like orange juice, and then it is fermented; that's all. The seeds and the skins are discarded right after the pressing of the grapes. Only the juice is fermented and eventually becomes white wine."

In the making of red wine, on the other hand, the whole grapes are crushed and everything is left together for two to three weeks—skins, seeds, 'flesh', parts of the string, a mixture that contains the red pigments of the skin (anthocyanins) and lots of OPC (proanthocyanidins), located in the skin and the seeds. Pigments

and OPC gradually dissolve into the wine during a continuing process of maceration.

"Anthocyanin and OPC dissolve even better when the alcohol starts to appear, because that's when fermentation takes place. At that moment, the OPC, which is concentrated on the outside of the skins, is suddenly bathed in a mixture of water and alcohol. The mixture is relatively warm, for, as you know, heat is released during fermentation. As a result, a considerable amount of OPC is dissolved. In white wine there is only the small amount from the skins which passes into the grape juice after the grapes are crushed. That is why white wine contains 20 to 50 times less OPC than red wine."

At the end of a Wine Congress held in Bruxelles in December 1994, during which he had 'spotlighted' the benefits of OPC, Jack Masquelier looked at the somewhat discouraged faces of French white wine producers. Trying to reassure them, he said: "Drink red wine for your health and white wine for your enjoyment."

THE FIRST OPC EXTRACT WORKED RIGHT AWAY

After he had isolated his first OPC, Masquelier immediately found his extract to be in high demand. As he remembers, "I had isolated the first OPC from the skin of the peanut in 1947. My Ph.D. tutor, the faculty dean, Francis Taillaud, had just got married. His wife, who was pregnant, suffered from oedema, like many pregnant women do. Oedema is the result of a lowered permeability of the hair vessels. She was often very tired. Especially, her legs were very tired and she had difficulty walking. The dean said to me: 'We can try it out on my wife, since you demonstrated that it wasn't toxic at all.'

"Well, the dean's wife was cured in 48 hours. So there had to be something special about my extract. Three years later, in 1950, the first vasculo-protective medicine was developed. It was called Resivit. It was the first vasculo-protective medicine to be based on OPC—in this case, OPC from peanut skin. So you see, all this goes back to 1950. It has been known for a long time."

How OPC relates to the condition of the vascular wall is explained by Masquelier as follows: "OPC is different from the famous yellow pigments, the flavonoids, because OPC attaches itself to proteins. OPC provides vascular protection because it has an affinity for one constituent of the vascular wall, collagen or elastin, i.e., proteins, whose task it is to form the walls of the small capillaries as well as the arteries, the veins and the lymphatic vessels. These proteins make the walls solid and supple, and it is because OPC has an affinity for these substances that they attach themselves to them, activate their metabolism, their synthesis, and prevent them from being destroyed too easily or pathologically. That's why OPC is, you could say, the vitamin of the vascular wall."

THE WHOLE CARDIOVASCULAR PICTURE

In combination with the proper functioning of the heart, a complete and unhindered blood flow is, without a doubt, the most essential physiological function of the body. It is no surprise that defects in the cardiovascular system are the reason why heart and vascular diseases are the number one killers in Western countries. One out of every two people (46% of all deceased men and 53% of all deceased women) die from a vascular and/or heart disorder.

The condition of the vascular wall is a determinant factor in cardiac and vascular diseases. After all, the vascular system regulates the bloodstream, and the blood supply is of vital importance for all cells and organs. In this respect, it is obviously important that particularly the heart muscle, the driving force of blood circulation, is copiously saturated with blood itself, since heart failure means death.

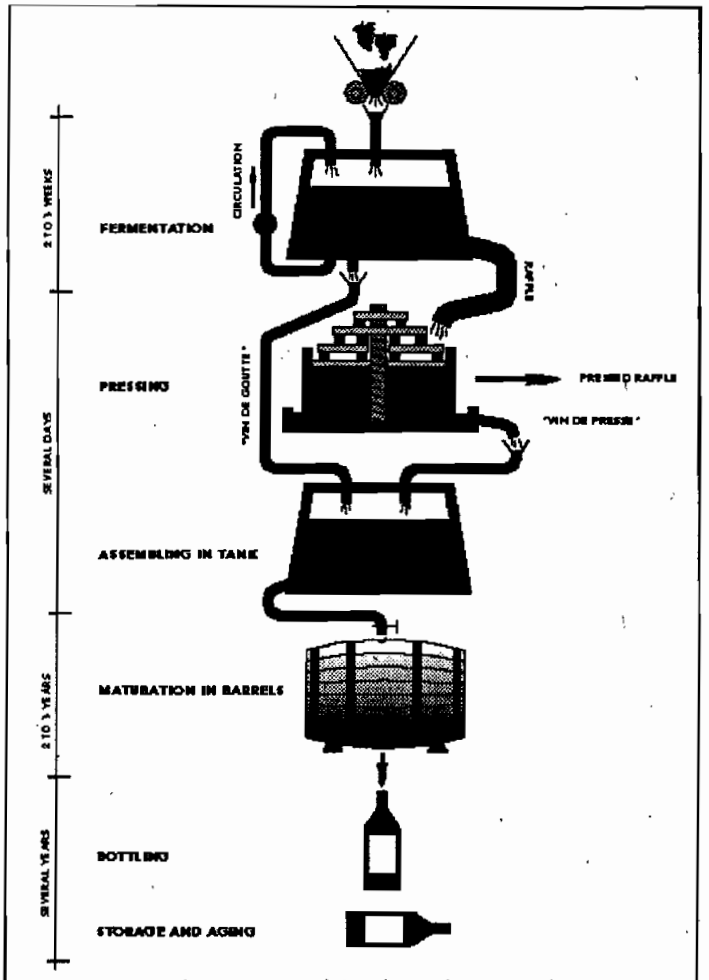


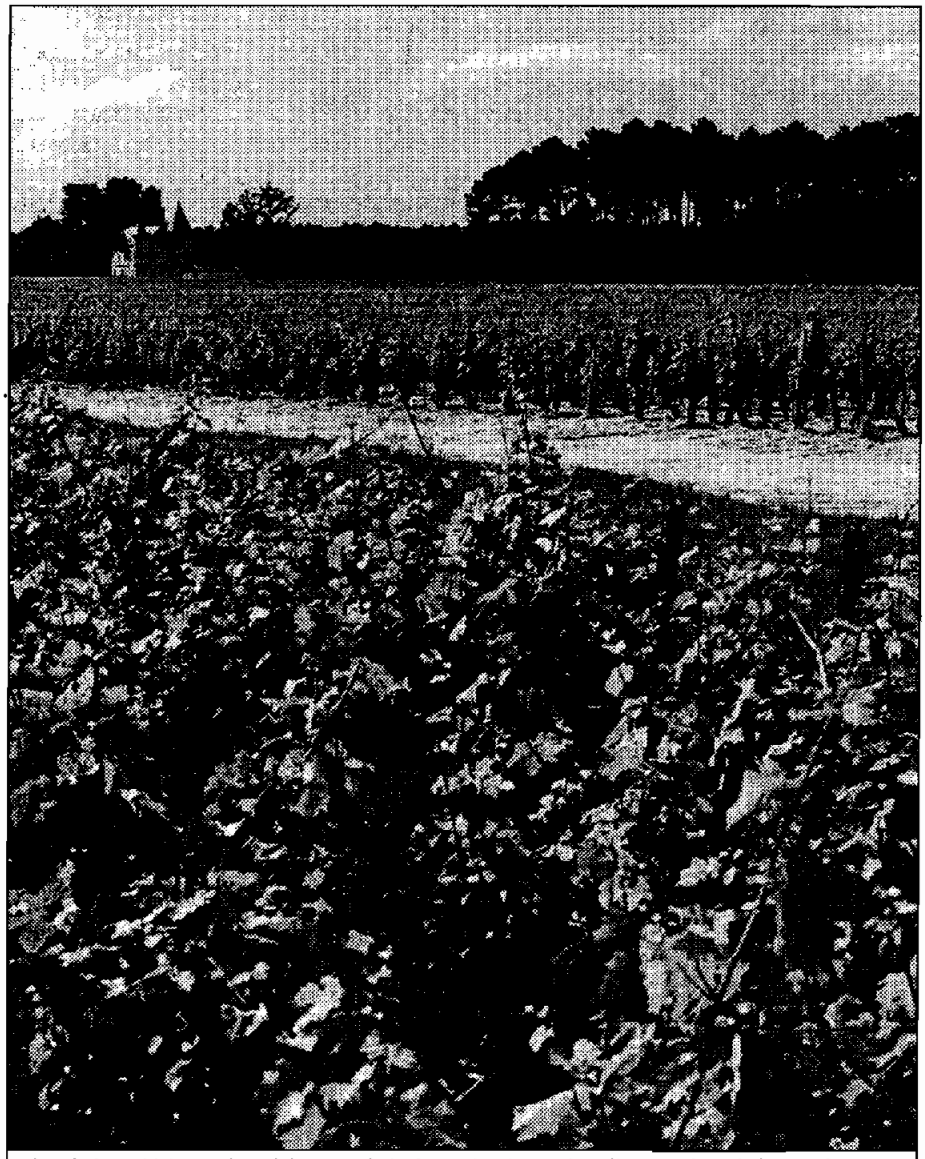
Fig. 3: Martine Baspeyras explains the making of red wine in her doctoral thesis, "Propriétés Bénéfiques des Vins Rouges du Bordelais". In the making of white wine, only the juice is used. There is no raffle, hence less OPC.

In 1981, Professor Masquelier presented for the first time his coherent theory about the influence of OPC on the essential factors that are determinative for the intactness of the vascular wall: collagen and elastin. These two building blocks of the vascular wall determine its elasticity and permeability. One could say that collagen consists of pairs of intertwining strains of proteins, the polypeptides. The stability of collagen is ascertained by the presence of the so-called cross-links that connect the polypeptide chains. The result is a structure that looks like a ladder that is being twisted without end.

OPC helps collagen with the construction of these cross-links and in this manner they help to aid in the stability of the connective tissue. Cross-links are often referred to in a negative sense, especially when they are formed in excess under the influence of free radicals. Excess cross-linking suffocates and stiffens the connective tissue. This excessive cross-linking manifests itself in all the visible signs of ageing, such as wrinkles. OPC helps prevent undesired and premature ageing by preventing over-cross-linking.

ENHANCING COLLAGEN'S BIOSYNTHESIS

OPC enhances the natural renewal and production of collagen, as regulated by the body itself. But OPC cannot perform the job all by itself. Vitamin C is another vital element in the biosynthesis of collagen. In fact, the decay of collagen due to lack of vitamin C produces all the symptoms of scurvy, since scurvy is nothing else than collagen decay. OPC comes into the picture because it is vit-



Already in 1933 it was found that people in France's wine regions live significantly longer than people in other areas. Later, in 1979, this phenomenon would become known as the "French Paradox".

amin C's most powerful co-factor.

The vitamin C sparing effect of OPC was well-documented by Masquelier and his colleague and friend, Professor M. J. Michaud. Their experiment showed that, in the absence of OPC, one needs to use more ascorbic acid. OPC provides optimal use of the vitamin C available in the body and thus helps the naturally controlled formation of collagen. Masquelier explains in more detail: "Collagen is a protein that contains two special amino acids, proline and lysine; not in their pure form, but as hydroxyproline and hydroxylysine. To put this differently, our genetic code does not code for hydroxyproline and hydroxylysine, but only for proline and lysine. So the collagen initiates the process of what we call hydroxylation of these two amino acids. The hydroxylation process requires vitamin C. Vitamin C provides the hydroxyls needed to transform proline into hydroxyproline, and lysine into hydroxylysine. And this is essential for the maturation of the collagen.

"How does OPC enter into play in all this? Simple. It boosts the vitamin C. In a way, they could be considered as vitamins C2. Professor Parrot, who did a lot of research on capillary resistance, on vascular problems, thought that these substances should be named vitamins C2, i.e., co-factors of vitamin C. We're now more or less back to the primitive ideas of Szent-Györgyi, but our arguments are better, for we've now studied this all the way down to the molecular level.

WHAT REGULAR INTAKE OF OPC DOES

"If you regularly take OPC," Masquelier says, "your vascular walls will be rein-

at hand when you can.

Their research demonstrated that, in the presence of OPC, much less cholesterol was deposited on the elastin tissue in the vascular wall than if OPC were absent.

forced. Say, you have a haemorrhage. In the morning you brush your teeth and discover that your gums are bleeding. Or, you notice a speck of blood on the cornea of the eye. Or, at night you feel tired, your calves are swollen, you notice oedemas, etc. In that case, you're suffering from vascular fragility, and OPC fights all these pathological mechanisms. It even goes one step further. In the human body, everything is 'vascularised'. Each and every cell needs to be nourished and supplied with oxygen. Well, what is in charge of this nourishment and enabling every cell to breathe? Ultimately, this is a task for the capillary vessels. They are the emissaries that go to each cell. The plumbing has to be in good shape. If there is a leak...of course, you know that leaks can be extremely dangerous, for example in the brain. I don't need to draw you a picture to make you understand what a cerebral haemorrhage is."

CHOLESTEROL

In 1957, A. Fay Morgan reported that animals that were administered wine appeared to be protected from a diet rich in cholesterol. The total amount of lipids in the blood and organs was lower than that of a control group of animals that were living on bread and water. A third group was exposed to a solution of alcohol dissolved in water, such as to check the results of the wine group. If alcohol and water didn't give the same results as wine, then it would be obvious that something other than alcohol did the trick. The alcohol-plus-water group did have a higher cholesterol and lipid level than the wine group. The conclusion was, therefore, that alcohol in wine couldn't be the cholesterol-restraining factor.

When Masquelier learned about this research, he naturally assumed immediately that the OPC in wine was responsible for the protection against excess cholesterol. His assumption was confirmed in 1966 when the German E. Merck company registered a patent describing OPC as cholesterol-regulating substances. "In particular," the Merck researchers wrote, "these substances exercise activities that lower the cholesterol level..."

In 1984, J. Wegrowski and his colleagues determined that OPC does even more than just lower the cholesterol level. Their research demonstrated that, in the presence of OPC, much less cholesterol was deposited on the elastin tissue in the vascular wall than if OPC were absent. OPC therefore keeps cholesterol deposits from forming in the vascular wall, and hence fights the process of atherogenesis. The cholesterol remains present in free form and can, in the instance of excess, be eliminated by the body.

DOCTORS CONFIRM SCIENTIFIC EVIDENCE

Even though OPC had been 'cornered' as a vasoprotector, medical doctors prescribing it wrote to Masquelier about other positive side-effects. He recalls, "I've often had doctors writing to me: 'I have prescribed OPC to my patients because they suffer from vascular fragility, because their legs are heavy, because they're bleeding, etc. But when I have laboratory tests done, I find that their cholesterol levels have gone down.' So, based on their experiences, some general practitioners have already been suggesting to me that OPC be used for other purposes than the treatment of vascular fragility. It seems that the influence of OPC goes beyond the domain of the vascular wall and that it does this in cooperation with vitamin C."

To be continued in the next issue of NEXUS...

This article is based on the book, ***OPC in Practice*** (1995, 2ed., ISBN 88-86035-10-1), written by Bert Schwitters in cooperation with Professor Emeritus Jack Masquelier. ***OPC in Practice*** is also available as an informative one-hour videotape. Copies of the book and video are available from:

- **Australia:** Sparkling Health, 35 Foxwood Avenue, Quakers Hill, NSW 2763; phone +61 (02) 837 2856, fax +61 (02) 837 4067.
- **Europe/UK:** Alfa Omega Editrice, Via San Damaso 23, 00165 Rome, Italy; phone +39 (06) 63039, fax +39 (06) 63 2196.
- **New Zealand:** Ortika NZ, 122 Manuka Street, Stokes Valley; phone/fax +64 (04) 563 7661.
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